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12 October 1961

NRO REVIEW COMPLETED

PHOTOGRAPHIC EVALUATION REPORT

Mission No: 9022 Photo Date: 12 September 1961 Evaluation No. FE 95-61
Film Type: J 23-7600 Filter, Main: W21 Filter, Horizon: W25
Camera No: 53 Evaluated by: CL

1. Shutter Operation:
 - a. Port horizon - Good
 - b. Starboard horizon - Good
2. Slit Operation (main): 0.2" - Good
3. Camera Number (Image Quality): illegible, of intermittent and variable exposure - coincident with digitote exposure.
4. Digitote Operation: Digitote "stuck" on pass 02, frames 15-40. Digitote exposed intermittently after pass 05 and was not exposed on passes 15, 18, 19, 20, 21E, 31 and 33. The tenth of a second digit was difficult to read throughout the mission.
5. Film Metering: Due to lack of horizon fiducials on many frames, metering had to be measured from the edge of the horizon format to the edge of the main format. This distance ranged from 0.0" to 0.2", (average 0.1"), becoming more erratic toward the end of the mission. On pass 31 the horizon format of frame 21 slightly overlapped the main format area of frame 22. Horizon fiducials began occurring within the main format area on pass 06. The metering appeared to correct itself at the beginning of every pass, but as the pass progressed the metering became more erratic.
6. Film Tracking: Normal
7. Timing Pulses: None
8. Shrinkage Markers: None
9. Fiducials:
 - a. Main Camera - center fiducial truncated throughout the mission.
 - b. Horizon Cameras - fiducials were exposed intermittently and with varying intensity - not coincident with camera number and digitote exposure problems. Intermittent fiducial exposure was first noted on pass 06.
10. Flare: Possible small reflections from within the camera noted on the first frame of most passes.
11. Light Leaks: Fogged frames were noted at the beginning and end of many passes. Operational passes preceded by engineering passes contained no fogged frames, indicating the film had to remain in place for a considerable length of time before accumulated light could degrade imagery. A total of 35 frames were degraded by light leaks as compared to 105 frames in mission 9023.
12. Forward Overlap: 10% to 15%
13. Static Electricity: Very little (See note 14 under remarks)
14. Pinholes: Very few
15. Abrasions and Scratches:
 - a. Produced in camera - continuous thin scratches outside of the format, leading and trailing edges. A small double scratch occurred on every frame 9" from that edge of the main format adjacent to the port horizon camera format and 1/16" in from the trailing edge.

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- b. Of undetermined origin - pass 00E, frames 01, 02, 04, 10; pass 01, frames 01, 07, 16, 23, 33; pass 02, frame 27; pass 03, frames 58, 72; pass 05, frames 71, 102; pass 06, frames 29, 56, 165, 170, 235, 287, 298, 301; pass 07, frames 09, 31, 37, 38, 44, 87, 92; pass 08, frames 40, 112, 125, 126; pass 09, frames 70, 76, 83, 92, 97, 98; pass 18, frame 47; pass 19, frame 76; pass 20, frame 99; pass 21, frames 158, 159; pass 23, frames 01, 198; pass 24, frame 65; pass 31, frame 06; pass 33, frames 01-06.
16. Tearing: small tear-shaped holes noted in the film on pass 19, frames 15, 17.
17. Processing Streaks: None noted
18. Pressure Marks: None
19. Water Marks: Very few
20. Blistering and Frilling: Few blisters, no frilling
21. Density: Medium 85%, heavy 15% (See note 16 under remarks)
22. Contrast: Medium 85%, low 15%
23. Apparent Resolution: Generally better than mission 9023 and showing greater potential than was produced in this mission. (See notes on degradations)
24. Apparent Granularity: Very fine
25. Photo Quality: Fair 20%, Good 80%
- a. Degradation primarily due to out of focus areas within the format.
26. Camera Operation: Fair
- a. Degradation due to flat horizon photos, no timing pips, erratic camera number and digitote, erratic horizon camera fiducials, portions of main format out of focus, light leaks at beginning and end of passes, numerous camera-caused desensitized streaks on the film, erratic end of pass indicator, blunted center fiducial.
27. Suitability for PI: Poor 10%, fair 20%, good 60%, very good 10%. Percentages pertain only to areas where some imagery could be identified.
- a. Degradation due to out of focus areas, heavy density, haze and cloud shadows.
- Remarks:
1. An average pitch of $+0^{\circ} 0' 30''$ and an average roll of $+01^{\circ} 03'$ was noted throughout the mission. The maximum variation in pitch was $+1^{\circ} 01'$ to $-0^{\circ} 42'$, and that for roll was $+2^{\circ} 27'$ to $-0^{\circ} 24'$. The minimum pitch was $0^{\circ} 0'$, minimum roll was $0^{\circ} 0'$. Roll appeared greatest at time of camera turn on.
 2. Degraded areas, that appeared out of focus, were noted on every frame of photography. They appeared along the leading edge of the film extending the full length of the frame and covered approximately 15% of the total frame area. In comparison with Mission 9023, the leading edge was not as well defined and the resolution adjacent to the edge was not as good.
 3. The end of pass markers were overexposed and occasionally covered a small portion of the main format.
 4. The end of pass markers were erratic, appearing occasionally at the beginning instead of at the end of a pass.
 5. Several small desensitized spots were observed throughout the mission. Examples: pass 06, frame 163; pass 07, frames 08, 144.
 6. The camera number occasionally overexposed and bloomed into the format area.

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7. Creases:
- Noted along the trailing edge of the film and probably due to film handling before evaluation - pass 00E; pass 01, frames 01-75; pass 03; pass 05E; pass 06, frames 301-318 (end); pass 07, frames 01-75, 151-191; pass 08, frames 01-75; pass 15; pass 21E; pass 21, frames 75-150, 226-229; pass 24, frames 60-75; pass 25, frames 01-14.
 - Indiscriminate creases were noted on pass 02, frame 27; pass 03, frame 31; pass 06, frame 287; pass 18, frame 47; pass 23, frame 153; pass 24, frames 82, 96, 112, 116.
8. Crimping: Pass 00E, frames 02, 03, 04, 05, 10; pass 01, frames 22, 28, 29, 38, 39, 71; pass 02, frames 09, 10, 11, 12, 16, 18, 23, 25, 27; pass 03, frames 01, 12, 63, 64; pass 05, frames 07, 75, 110; pass 05E, frame 02; pass 06, frames 104, 143, 152, 153, 198; pass 07, frames 44, 179, 180; pass 08, frames 21, 113, 127, 128, 129, 135, 181, 184, 194; pass 09, frames 89, 98, 141; pass 15, frame 26; pass 18, frame 42; pass 19, frames 66, 81, 83; pass 20, frames 04, 05, 26, 27, 28, 29, 30, 31, 47; pass 21, frames 03, 04; pass 22, frames 10, 173, 212, 225, 253; pass 23, frame 151; pass 31, frames 06-11.
9. Foreign material noted on pass 00E, frames 01-10; pass 01, frames 02, 04, 09, 15, 20, 21, 30, 31, 32, 37, 60, 61, 65; pass 02, frames 01, 07, 27, 28, 36, 43; pass 03, frames 34, 49, 51, 52; pass 05, frame 47; pass 06, frames 82, 117, 126; pass 08, frame 185; pass 09, frames 84, 85, 96, 97, 134, 137; pass 15, frames 18, 32; pass 19, frames 17, 18; pass 21, frames 01, 12, 26; pass 22, frames 166, 174, 176, 192, 230; pass 23, frames 120, 145.
10. Bits of emulsion lifted from pass 00E, frames 01, 02; pass 01, frames 02, 03, 08, 20; pass 05, frame 46; pass 06, frames 14, 259, 287, 290, 310, 311; pass 07, frames 41, 143; pass 08, frame 139; pass 09, frames 37, 69, 79, 90, 91; pass 15, frame 03; pass 22, frames 160, 175; pass 23, frame 48; pass 31, frame 05.
11. Numerous frames contained large single, double or multiple desensitized streaks in the main format area that did not pass through the horizon camera formats. The streaks were not parallel to the edge of the format and did not show any definite pattern. Multiple streaks were noticed running parallel to the leading and trailing edges wherever frame included water areas.
12. Numerous small shiny black spots were noted on the base side of the film, indicative of small pressure spots.
13. Pass 05, frame 132 had a black spot with scratches emanating from it.
14. Static electricity was occasionally observed over the horizon formats. Example: pass 06, frames 41, 45, 47, 49.
15. Manufacturing splices were noted on pass 06, frame 287; pass 09, frame 86; pass 25, frame 14. A large deep crease and static electricity was noticed after the manufacturing splice on pass 06, frame 287.
16. Density readings were made on every pass, using the Eastman Kodak Reflection-Transmission Color Densitometer Model RT.

Pass No.	Frame	D Max	D Min	Base Fog
01	01	2.10	1.18	0.15
	42	2.28	0.62	0.16
	66	2.14	0.64	0.15
02	01	2.07	1.16	0.14
	24	2.07	0.71	0.18
	42	2.03	0.58	0.17
03	02	2.00	0.45	0.15
	36	2.07	0.47	0.15
	62	2.02	0.56	0.13

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Pass No.	Frame	D Max	D Min	Base Fog
05	03	1.90	0.44	0.15
	77	2.07	0.60	0.12
	168	1.95	0.58	0.12
06	02	2.04	0.65	0.15
	173	2.16	0.60	0.14
	316	2.01	1.28	0.24
07	13	1.94	0.54	0.18
	69	2.14	0.59	0.14
	165	2.12	0.49	0.13
08	04	2.15	0.27	0.12
	74	2.02	0.58	0.10
	170	2.22	1.13	0.12
09	04	2.04	0.21	0.11
	76	2.12	0.68	0.11
	158	2.19	0.58	0.12
15	03	2.17	0.58	0.10
	13	2.15	0.42	0.10
	29	1.85	0.63	0.10
18	03	1.97	0.42	0.10
	47	1.98	0.56	0.10
19	04	1.72	0.26	0.09
	50	2.07	0.32	0.09
	96	2.20	0.38	0.10
20	07	1.72	0.29	0.13
	52	2.11	0.92	0.14
	78	2.21	0.57	0.12
21	15	2.04	0.45	0.12
	157	2.20	1.00	0.12
	228	2.00	1.02	0.12
22	13	2.07	0.45	0.12
	152	2.20	0.59	0.12
	248	2.14	0.88	0.12
23	12	1.90	0.57	0.13
	152	1.78	1.10	0.11
	194	1.83	0.87	0.16
24	29	1.86	0.32	0.13
	103	2.19	0.82	0.12
	165	1.78	0.48	0.12
25	02	1.89	0.53	0.12
	150	1.98	0.37	0.15
	154	2.10	0.40	0.12
	129	1.70	0.38	0.17
31	15	2.07	0.64	0.13
33	16	2.00	0.35	0.12

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D Max range 2.28 - 1.70 Average 2.03

D Min range 1.28 - 0.21 Average 0.60

Base Fog range 0.18 - 0.09 Average 0.13

Range 2.28 - 0.21

Average 1.3

Minimum D Min to Maximum D Max = 2.07

Average D Min to Average D Max = 1.43

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